NI-9206 Getting Started

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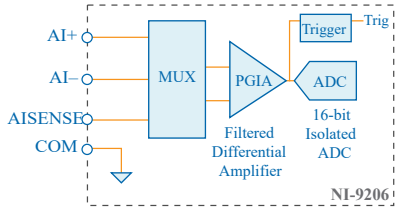
NI-9206 Block Diagram

The NI-9206 channels share a common ground (COM) that is isolated from other modules in the system. All channels share a programmable gain instrumentation amplifier and are multiplexed to an ADC. Each channel also has ±30 V overvoltage protection.

Figure 1. Input Circuitry for One Analog Input Channel on the NI-9206



NI-9206 Pinout

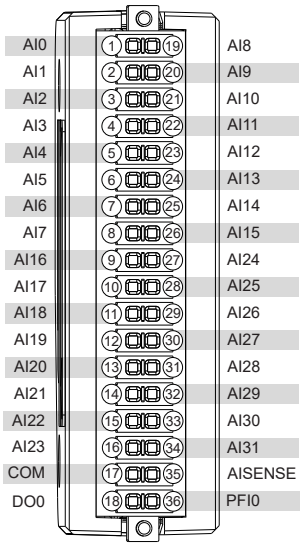


Table 1. Signal Descriptions

Signal	Description
AI	Analog input signal connection
AISENSE	Reference connection for NRSE measurements

Signal	Description
COM	Common reference connection to isolated ground
DO	Digital output signal connection
PFI	Programmable function interface, digital input signal connection

NI-9206 Signals

You can connect single-ended or differential signals to the NI-9206; use a differential measurement configuration to attain more accurate measurements and less noise. Specific signal pairs are valid for differential connections.

The following table shows the signal pairs that are valid for differential connection configurations with the NI-9206.

Table 2. NI-9206 Differential Pairs

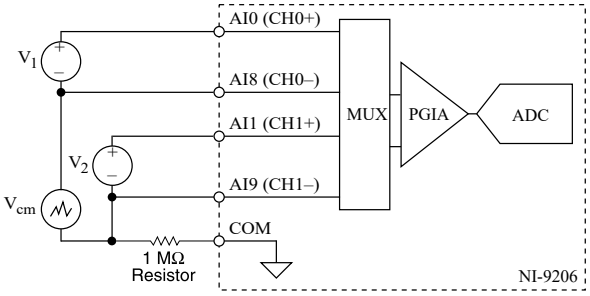
Channel	AI+	AI-
0	AI0	AI8
1	AI1	AI9
2	AI2	AI10
3	AI3	AI11
4	AI4	AI12
5	AI5	AI13
6	AI6	AI14
7	AI7	AI15
16	AI16	AI24
17	AI17	AI25
18	AI18	AI26
19	AI19	AI27
20	AI20	AI28

Channel	AI+	AI-
21	AI21	AI29
22	AI22	AI30
23	AI23	AI31

Connecting Floating Differential Signals to the NI-9206

Refer to the following figure to connect floating differential signals to the NI-9206.

Figure 1. Connecting Floating Differential Signals to the NI-9206

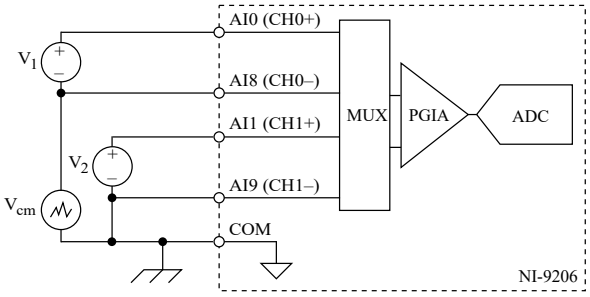


To connect floating differential signals to the NI-9206, you must connect the negative signal to COM through a 1 MΩ resistor to keep the voltage within the maximum working voltage. If the voltage source is outside the maximum working voltage, the NI-9206 does not read data accurately.

Connecting Grounded Differential Signals to the NI-9206

Refer to the following figure to connect grounded differential signals to the NI-9206.

Figure 1. Connecting Grounded Differential Signals to the NI-9206

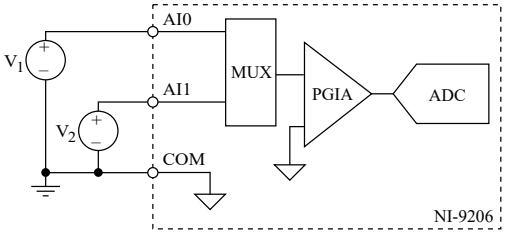


In a differential configuration, the NI-9206 rejects the common-mode noise voltage during the measurement of V_1. To connect grounded differential signals to the NI-9206, you must also connect the signal reference to COM.

Connecting Referenced Single-Ended Voltage Signals to the NI-9206

Refer to the following figure to connect referenced single-ended (RSE) signals to the NI-9206.

Figure 1. Connecting RSE Voltage Signals



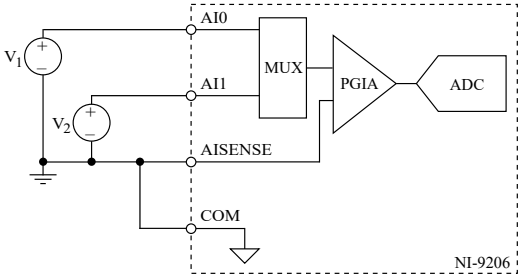
In an RSE configuration, the NI-9206 measures each channel with respect to COM. To connect RSE signals to the NI-9206, you must connect the voltage ground signal to COM to keep the maximum working voltage in the specified range.

Note If you leave COM unconnected, the signals float outside the working input range of the NI-9206. This may result in unreliable measurements because there is no way to ensure that the input signal is within 10 V of COM.

Connecting Non-Referenced Single-Ended Voltage Signals to the NI-9206

Refer to the following figure to connect non-referenced single-ended (NRSE) signals to the NI-9206.

Figure 1. Connecting an RSE Voltage Signal to the NI-9206

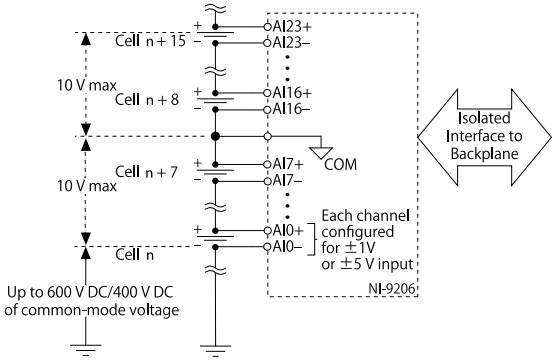


In an NRSE configuration, the NI-9206 measures each channel with respect to AISENSE. An NRSE configuration provides remote sense for the negative input of the PGIA that is shared by all channels and also provides improved noise rejection compared to an RSE connection.

Connecting Fuel Cell Devices to the NI-9206

Refer to the following figure to connect a fuel cell device to the NI-9206.

Figure 1. Connecting a Fuel Cell Device to the NI-9206



NI-9206 Connection Guidelines

- Make sure that devices you connect to the NI-9206 are compatible with the module specifications.
- You must use 2-wire ferrules to create a secure connection when connecting more than one wire to a single terminal on the NI-9206.
- When using a solid wire or a stranded wire with a ferrule with the NI-9206, push the wire into the terminal.
- When using stranded wire without a ferrule with the NI-9206, open the terminal by pressing the push button.

Connecting Wires to the NI-9206 Spring Terminal Connector

What to Use

- NI-9206 (black/orange connector)
- 0.13 mm^2 to 1.5 mm^2 (26 AWG to 16 AWG) copper conductor wire with 10 mm (0.394 in.) of insulation stripped from the end
- Ferrules (optional)

What to Do

Refer to the following table for how to insert a wire into a terminal depending on what type of wire you are using or if you are using a ferrule.

Option	Description
When using a solid wire or stranded wire with a ferrule	Push the wire into the terminal when using a solid wire or stranded wire with a ferrule
When using a stranded wire without a ferrule	Press the push button and then push the wire into the terminal

Note You must use 2-wire ferrules to create a secure connection when connecting more than one wire to a single terminal.

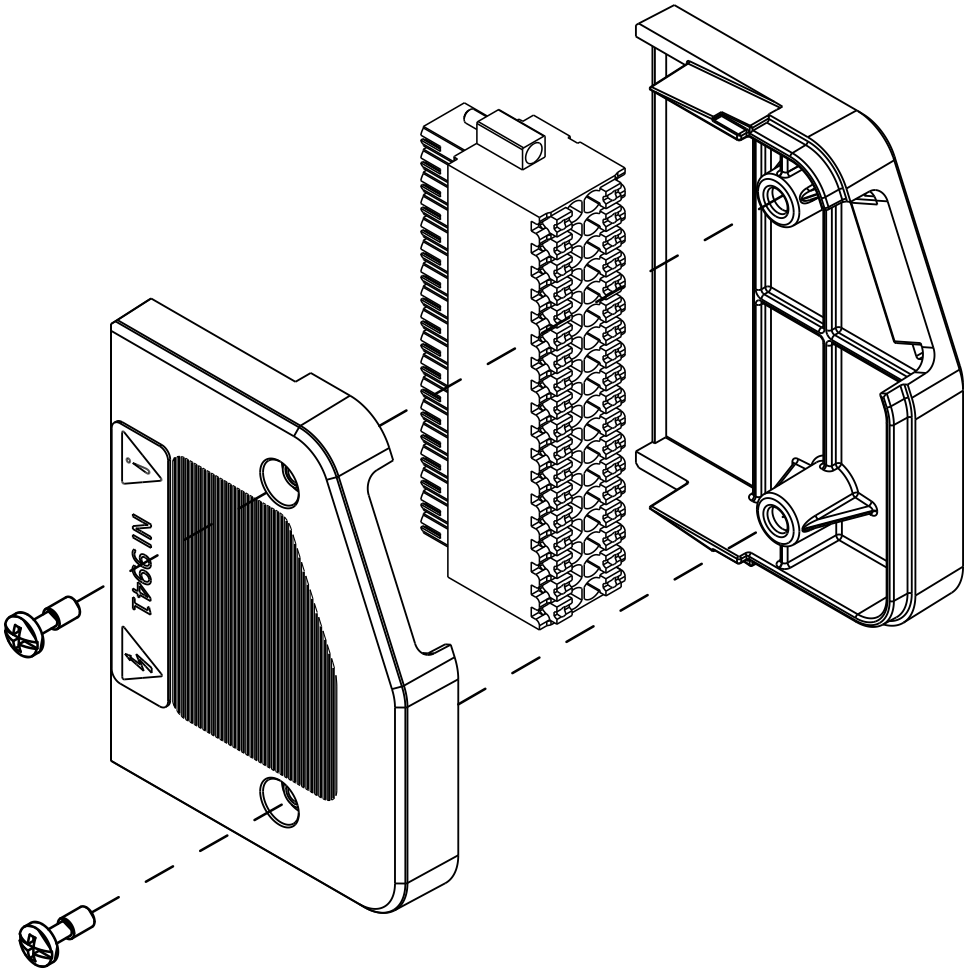
High-Vibration Application Connections

If your application is subject to high vibration, NI recommends that you use the NI-9941 backshell kit to protect connections to the NI-9206.

Installing the NI-9941 Connector Backshell

To meet the EMC guidelines in this document and the Electromagnetic Compatibility specifications in the ***NI-9206 Specifications***, you must use the NI-9941 connector backshell kit.

Figure 1. NI-9941 Connector Backshell Installation



1. Install the NI-9941 backshell on the 36-pin spring-terminal connector.
2. Tighten the NI-9941 backshell screws to 0.45 N · m(4.0 lb · in) torque.

Note The NI-9941 can be installed with the backshell opening on either end of the connector to allow for routing wires in the direction your system requires.